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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|----------------------|------------------|
| 10/750,654 | 12/31/2003 | Soon Chan Park | 11036-056-999 | 1612 |
| 24341 | 7590 | 11/10/2005 | EXAMINER | |
| MORGAN, LEWIS & BOCKIUS, LLP. 2 PALO ALTO SQUARE 3000 EL CAMINO REAL PALO ALTO, CA 94306 | | | ALEXANDER, MICHAEL P | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1742 | |

DATE MAILED: 11/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|----------------------------------|---------------------------------|--|
| Office Action Summary | Application No. 10/750,654 | Applicant(s) PARK, SOON CHAN | |
| | Examiner Michael P. Alexander | Art Unit 1742 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>5/25/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities: in paragraph 005 line 2, "fillet" should read –billet--.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansel et al (US 2,294,648) in view of Hseu et al. ("Grain Refinement of Magnesium Alloy Billets for Thixoforming").

Regarding claim 1, Ansel et al. teach (col. 1 line 38 – col. 2 line 3) a method for fabricating a magnesium alloy billet (i.e. a section of nonferrous metal ingot hot-worked by forging, rolling, or extrusion) comprising processing a

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magnesium alloy ingot by extrusion, rolling (i.e. compression) and isothermal annealing (i.e. holding), respectively, wherein the temperature in the isothermal holding is increased up to an isothermal holding temperature.

Still regarding claim 1, Ansel et al. do not specify that the magnesium alloy billet would be "for a thixoforming process", that the magnesium alloy would be AZ91D and that the isothermal holding temperature would be sufficient to obtain a primary solid phase having a size of about 40-60 micrometers.

With respect to limitation that the magnesium alloy billet would be "for a thixoforming process" in claim 1, the Examiner considers the recitation "for a thixoforming process" to be a recitation of the intended use of the magnesium alloy billet that does not result in a structural difference between the magnesium alloy billet of the claimed invention and the prior art, and therefore does not patentably distinguish the claimed invention from the prior art.

With respect to the limitation that the magnesium alloy would be AZ91D in claim 1, Hseu et al. teach (first paragraph on page 136, figure 2) in a method of producing magnesium alloys for thixoforming that AZ91D has the potential for major applications in thixoforming. It would have been obvious to one of ordinary skill in the art to modify the method of Ansel et al. by using AZ91D as the magnesium alloy because AZ91D has the potential for major applications in thixoforming as taught by Hseu et al.

With respect to the limitation that the isothermal holding temperature would be sufficient to obtain a primary solid phase having a size of about 40-60 micrometers in claim 1, Ansel et al. teach (col. 1 line 38 – col. 2 line 3) that the

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holding temperature would be 500 to 900 degrees F, which would inherently be an isothermal holding temperature sufficient to obtain a primary solid phase having a size of about 40-60 micrometers.

Regarding claim 3, Ansel et al. teach (col. 1 line 47 – col. 2 line 19) rolling at a temperature of about 400 to about 800 degree F to cause a 0.1 to 20 percent reduction in thickness. The temperature range and percent reduction range overlap with the corresponding ranges of the claimed invention, which is prima facie evidence of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art to select the desired temperature and percent reduction in thickness from the ranges disclosed by Ansel et al. because Ansel et al. teach the same utility throughout the disclosed range.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ansel et al. in view of Hseu et al. as applied to claim 1 above, and further in view of Huang et al. (TW 536558).

Regarding claim 2, Ansel et al. do not specify an extrusion rate of 350-400 degrees C and a compression ratio of about 30-50:1. However, Huang et al. teach (abstract) applying an extrusion rate of 20-50:1 at 250-350 degrees C and teach that the method results in superior low temperature superplasticity. It would have been obvious to one of ordinary skill in the art to modify the method of Ansel et al. by selecting an extrusion rate of 20:50:1 at 250-350 degrees C in order to achieve superior low temperature superplasticity as taught by Huang et al. Furthermore, the extrusion rate and temperature range of Huang et al. overlaps with the claimed range, which is prima facie evidence of obviousness.

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See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art to select the desired extrusion rate and temperature range from the ranges disclosed by Huang et al. because Huang et al. teach the same utility throughout the disclosed range.

Claims 4-6 rejected under 35 U.S.C. 103(a) as being unpatentable over Ansel et al. in view of Hseu et al. as applied to claim 1 above, and further in view of Zhou et al. (US 6,120,625)

Regarding claims 4-6, Ansel et al. teach (col. 2 lines 20-22) holding at a temperature of 300 to 800 degrees F, which overlaps with the temperature range of the claimed invention, which is prima facie evidence of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art to select the desired temperature from the range of Ansel et al. because Ansel et al. teach the same utility throughout the disclosed range.

Still regarding claims 4-6, Ansel et al. do not specify a heating rate of about 1.0 to 5.0 degrees per second. However, Zhou et al., in a similar method of extruding, compressing and isothermal holding, teach (col. 6 lines 53-59) that the heating rate is a factor in obtaining a fine spheroidal grain microstructure of desired dimensions, and that the heating rate should allow for recrystallized nuclei to be formed but not provide enough time for the nuclei to grow up before temperature of the metal reaches its solidus temperature, in order to assure a desired fine spheroidal grain microstructure in the semi-solid formed metal. Since heating rate is a result-effective variable as taught by Zhou et al., it would have been obvious to one of ordinary skill in the art to modify the method of

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Ansel et al. by selecting the desired heating rate by routine optimization in order to obtain a fine spheroidal grain microstructure of desired dimensions as taught by Zhou et al.

Still regarding claims 4-6, Ansel et al. do not specify a maintaining time of about 30 seconds through about 180 seconds. However, Zhou et al., in a similar method of extruding, compression and isothermal holding, teach (col. 6 lines 61-65) teach that time of maintaining at temperature should be sufficient to allow for the microstructure to be transformed into discrete spheroidal particles suspended in a lower melted liquid and teach that the time can be between a few seconds and some hours depending on the nature of the metal. Since the maintaining time is a result-effective variable as taught by Zhou et al., it would have been obvious to one of ordinary skill in the art to select the desired maintaining time in order to form discrete spheroidal particles suspended in a lower melted liquid as a routine optimization as taught by Zhou et al.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael P. Alexander whose telephone number is 571-272-8558. The examiner can normally be reached on M-F 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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